Mrs. Hayden

Name Key Date_____

201 Chapter 3 Review Topics

3.1 Skew lines, Parallel and Perpendicular lines and planes

3.2 Identifying angles

Corresponding, Alternate interior, Alternate Exterior, Consecutive Interior

Postulate and Theorems for when the lines are parallel

Proofs

3.3 Converses and Proofs

3.4 Slopes of lines

Are they perpendicular? Parallel?

3.5 Equations of lines

Parallel, Perpendicular, horizontal, vertical

3.6 Distance between parallel lines

Distance between a point and a line

Equation of perpendicular bisector

The review worksheet consists mostly of 3.6 with some of 3.4 and 3.5 incorporated.

So use old worksheets to review proofs and the other concepts. Or use the textbook to review the other concepts.

Some pages from the text you can use:

p.158 #s 27-32, 35, 36

p.166 #s 19-21, 26

p.168 #s 34, 35 (proofs)

Review of 3.6 (3.4 and 3.5)

Are the lines perpendicular?

1. p_1: $y = 3x + 5$

   p_2: $y = \frac{1}{3}x + 5$ (No)

2. p_1: $7x + 2y = 5$ $m = \frac{-7}{2}$

   p_2: $2x - 7y = 5$ $m = \frac{2}{7}$ yes

Determine if the intersection of $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ forms a right angle.

3. A (-7,0) B (-2, -1) C(-3, 6) D(-4, -3)

   $\overline{AB}$ $m = \frac{0--1}{-7--2} = -\frac{1}{5}$

   $\overline{CD}$ $m = \frac{6--3}{-3--4} = \frac{9}{1}$ (No)

4. A (-4,4) B (4, 3) C(-2, -4) D(-1, 4)

   $\overline{AB}$ $m = \frac{4-3}{-4-4} = \frac{1}{-8}$

   $\overline{CD}$ $m = \frac{-4-4}{-2--1} = \frac{-8}{-1} = 8$ (yes)

Line j is perpendicular to the line with the given equation and line j passes through P. Write an equation of line j.

5. $y = \frac{1}{6}x + 5$, P(-3,1)

   $1 = -6(-3) + b$

   18

   $-17 = b$

   $y = -6x - 17$

6. $y = -\frac{5}{2}x + 1$, P(-5,6)

   $6 = \frac{2}{5}(-5) + b$

   $8 = b$

   $y = \frac{2}{5}x + 8$

Decide whether the lines with the given equations are parallel, perpendicular, or neither.

7. $y = -5x - 2$

   $y = 5x + 2$

   Neither

8. $y = \frac{1}{3}x - 1$

   $y = -3x + 2$

   ⊥

9. $2x - 5y = 8$ $m = \frac{2}{5}$

   $5x - 2y = 2$ $m = \frac{5}{2}$

   neither

Find the equation of the line that is the perpendicular bisector of $\overline{PQ}$.

10. ***P(-4, 3)*** ***Q (4, -1)***

    $M(0,1)$ $m = \frac{3--1}{-4-4} = \frac{4}{-8} = -\frac{1}{2}$

    $m = 2$

    $y = 2x + 1$

11. ***P(-2, 6)*** ***Q(4, 2)***

    $m = \frac{6-2}{-2-4} = \frac{4}{-6} = -\frac{2}{3}$

    $M(1,4)$ $m = \frac{3}{2}$

    $4 = \frac{3}{2}(1) + b$

    $2.5 = b$

    $y = \frac{3}{2}x + \frac{5}{2}$

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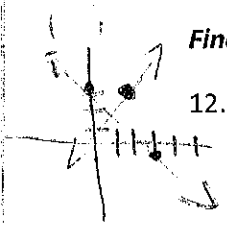


Find the distance between the point and the line below.

12. (2, 3); $4x + 3y = 10$

$y = -\frac{4}{3}x + \frac{10}{3}$

$3 = \frac{3}{4}(2) + b$

$\frac{3}{2} = b$

$\begin{cases} y = \frac{3}{4}x + \frac{3}{2} \\ y = -\frac{4}{3}x + \frac{10}{3} \end{cases}$

$\left[\frac{3}{4}x + \frac{3}{2} = -\frac{4}{3}x + \frac{10}{3}\right] \times 12$

$9x + 18 = -16x + 40$

$25x = 22$

$x = .88$

$y = 2.16$

$(2, 3)$

$(.88, 2.16)$

$d = \sqrt{(2-.88)^2 + (3-2.16)^2}$

$= 1.4$ units

13. (–2, 1); $x - y = 2$

$y = -x + b$

$1 = -1(-2) + b$

$-1 = b$

$\begin{cases} y = -x - 1 \\ y = x - 2 \end{cases}$

$2y = -3$

$y = -\frac{3}{2}$

$x = \frac{1}{2}$

$(\frac{1}{2}, -\frac{3}{2})(-2, 1)$

$d = \sqrt{(\frac{1}{2} - -2)^2 + (-\frac{3}{2} - 1)^2}$

$\sqrt{12.5}$

$d \approx 3.54$ units

14. (-2,6); $y = \frac{1}{4}x + 3$

$6 = -4(-2) + b$

$-2 = b$

$\begin{cases} y = -4x - 2 \\ y = \frac{1}{4}x + 3 \end{cases}$

$\left[-4x - 2 = \frac{1}{4}x + 3\right] \cdot 4$

$-16x - 8 = x + 12$

$-20 = 17x$

$-\frac{20}{17} = x \qquad y = \frac{46}{17}$

$(-\frac{20}{17}, \frac{46}{17})(-2, 6)$

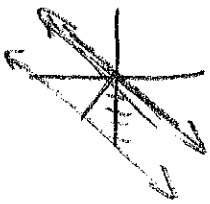
$d = \sqrt{\left(-2 + \frac{20}{17}\right)^2 + \left(6 - \frac{46}{17}\right)^2}$

$d \approx 3.40$ units

Find the distance between each pair of parallel lines.

15. $y = -x$

$y = -x - 4$



$\begin{cases} y = x \\ y = -x - 4 \end{cases}$ $(-2, -2)$ $(0, 0)$

$x = -2$

$y = -2$

$d = \sqrt{(0 - -2)^2 + (0 - -2)^2}$

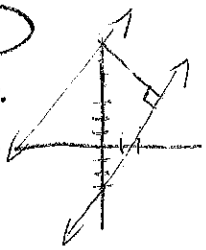
$\sqrt{8}$

$2\sqrt{2}$ units

≈ 2.83

16. $y = 2x + 7$

$y = 2x - 3$



$\begin{cases} y = -\frac{1}{2}x + 7 \\ y = 2x - 3 \end{cases}$

$-\frac{1}{2}x + 7 = 2x - 3$

$10 = 2\frac{1}{2}x$

$4 = x$

$(4, 5)$ $(0, 7)$

$d = \sqrt{(4-0)^2 + (5-7)^2}$

$16 + 4$

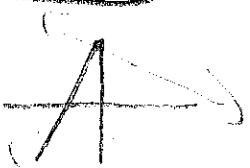
$\sqrt{20}$

$= 2\sqrt{5}$

≈ 4.47 units

17. $y = -\frac{1}{3}x - 15$

$x + 3y = 15$



$\begin{cases} y = 3x + 5 \\ y = -\frac{1}{3}x - 15 \end{cases}$

$3x + 5 = -\frac{1}{3}x - 15$

$3\frac{1}{3}x = -20$

$x = -6$

$y = -13$

$(-6, -13)$

$(0, 5)$

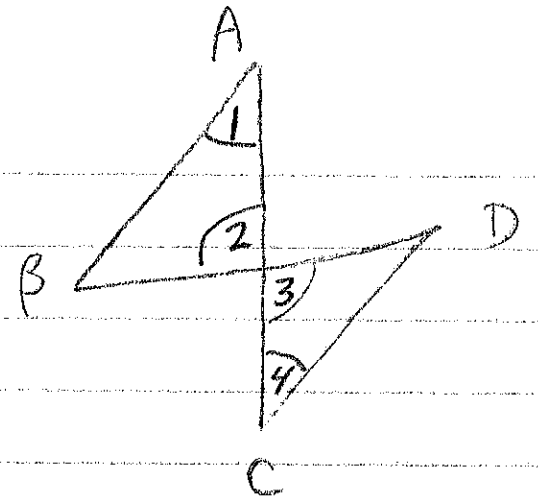
$d = \sqrt{(0 - -6)^2 + (5 - -13)^2}$

$36 \quad +18$

$d \approx 18.97$ units

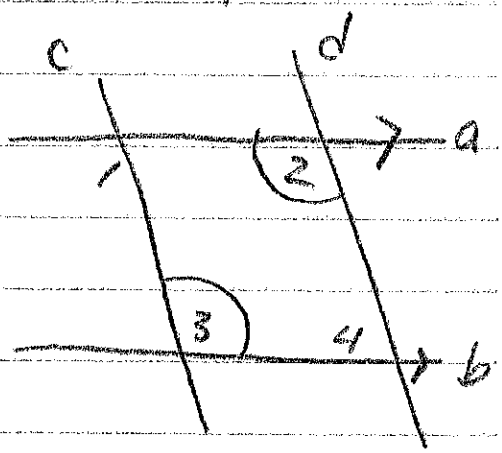
See next page

p168



34. G: $\angle 1 \cong \angle 2$
$\angle 3 \cong \angle 4$
P: $\overline{AB} \parallel \overline{CD}$

S.	R.
① $\angle 1 \cong \angle 2$	① Given
② $\angle 2 \cong \angle 3$	② Vert. $\angle$s $\cong$
③ $\angle 3 \cong \angle 4$	③ Given
④ $\angle 1 \cong \angle 4$	④ Transitive
⑤ $\overline{AB} \parallel \overline{CD}$	⑤ Alt Int $\angle$s Conv.

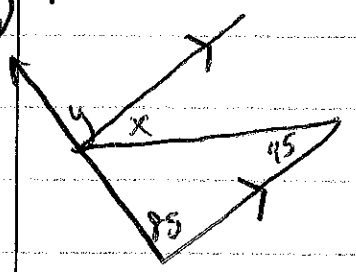


35. G: $a \parallel b$ $\angle 2 \cong \angle 3$
P: $c \parallel d$

S	R
① $a \parallel b$ $\angle 2 \cong \angle 3$	① Given
② $\angle 3 \cong \angle 1$	② Alt Int $\angle$s Thm
③ $\angle 2 \cong \angle 1$	③ Transitive
④ $c \parallel d$	④ Corr $\angle$s Converse

p158 27-32, 35, 36

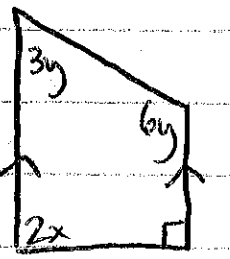
(27)



$x = 45$

$y = 85$

(28)



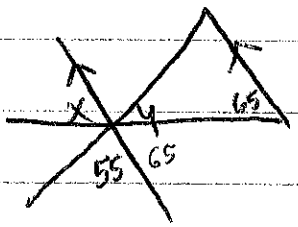
$9y = 180$

$y = 20$

$2x = 90$

$x = 45$

(29)



$x = 65$

$y = 60$

$180 - 120$

30

$3x = 60$

$x = 20$

$5y - 5 + 135 = 180$

$5y = 50$

$y = 10$

31

$4x = 52$ (alt. int.)

$x = 13$

$3y + 2 = 38$

$-2 \quad -2$

$3y = 36$

$y = 12$

32

$5x + 14x - 10 = 180$ (s-sid)

$19x = 190$

$x = 10$

$2y = 50$

$y = 25$

35

$2x - y = 120$

$2x + y = 140$

$4x = 260$

$x = 65$

$y = 10$

36

$5x - y = 30$

$5x + y = 50$

$10x = 80$

$x = 8$

$y = 10$

p166 19-21, 26

19. yes cons int ∠s conv

20. yes alt ext ∠s conv

21. no

26. $\overrightarrow{EA} \parallel \overrightarrow{HC}$ corr ∠s conv

$\overrightarrow{EB}$ not $\overrightarrow{HD}$ corr ∠s ≠